

REMARKS

In the Office Action, claims 4 and 5 were rejected under 35 U.S.C. §103. Claim 3 was previously withdrawn due to a restriction requirement. Claim 4 has been amended herein. No new matter has been added thereby. This Amendment is submitted with a Request for Continued Examination ("RCE"). A check in the amount of \$790.00 is submitted herewith to cover the cost of the RCE. Please charge Deposit Account No. 02-1818 for any insufficiency or credit. Applicant believes that the rejections are improper or have been overcome for at least the reasons listed below.

In the Office Action, claims 4 and 5 are rejected under 35 U.S.C. §103 in view of U.S. Patent No. 6,428,218 to Müssig ("*Müssig*") and U.S. Patent No. 5,570,446 to Zheng et al. ("*Zheng*"). The Patent Office relies primarily on *Müssig*, and thus further relies on *Zheng* to remedy the deficiencies of *Müssig*. Claim 4 was amended in order to clarify that the estimation of the heating center is performed along an axial direction of the optical fiber and that the positioning of the fibers along the axial direction is based on the estimation of the heating center. Support for these clarifying amendments may be found at, for example, page 11, lines 13-17 of the specification.

Of the claims at issue, claim 4 is the sole independent claim. Amended claim 4 recites a method for fusion splicing of an optical fiber using an optical fiber fusion splicer, wherein the optical fiber fusion splicer includes a setting means for setting respective end surfaces of two optical fibers that are to be spliced in order to abut against each other, a heating means for generating an arc discharge between two discharge electrodes and heating an abutment portion of said optical fibers using a discharge beam, and an image pickup means for picking up an image of said discharge beam. The method includes: (a) measuring, from image signals obtained by the image pickup means when a preliminary arc discharge is generated between said discharge electrodes when no optical fibers have been placed in a discharge area, brightness distributions on a plurality of lines that are set at different positions along a rectilinear direction between said discharge electrodes and run in a direction substantially at right angles to the rectilinear direction; (b) estimating a heating center of the arc discharge along an axial direction of the optical fiber from the plurality of brightness distributions; (c) controlling a position of said setting means along the axial direction of the optional fiber such that the abutment portion of said

two optical fibers is positioned in the estimated heating center; and; and thereafter (d) controlling said heating means such that a main arc discharge is generated and said abutment portion is heated by said discharge beam.

In amended claim 4, the heating center of the arc discharge along the axial direction of the optical fiber is estimated based on the result of the preliminary arc discharge which is performed when no optical fibers have been placed in a discharge area. Then, the position of the setting means along the axial direction of the optical fiber is controlled in order to position the abutment portion of the optical fibers in the estimated heating center. (See, Specification, pg. 12, lines 3-13). Therefore, the positioning of the abutment portion of the optical fibers *along the axial direction is based on the result of the preliminary arc discharge*.

As recognized on page three of the Office Action, *Müssig* is distinguishable for a number of reasons. More specifically, *Müssig* does not disclose, teach or suggest (a) measuring, from image signals obtained by the image pickup means when a preliminary arc discharge is generated between said discharge electrodes when no optical fibers have been placed in a discharge area, brightness distributions on a plurality of lines that are set at different positions along a rectilinear direction between said discharge electrodes and run in a direction substantially at right angles to the rectilinear direction; (b) estimating a heating center of an arc discharge along an axial direction (i.e., the Z direction) from the plurality of brightness distributions, where the brightness distributions are measured as described above; and (c) controlling a position of said setting means along the axial direction of the optional fiber such that the abutment portion of said two optical fibers is positioned in the estimated heating center. Accordingly, *Müssig* does not disclose, teach or suggest the elements of amended claim 4 and claim 5. In addition, Applicant believes that *Zheng* fails to cure the deficiencies of *Müssig*.

Zheng is generally directed to a method of alignment and control for fusion splicing two ends of optical fibers. *Zheng* discloses rough and fine alignment in the X, Y, and Z directions, where the Z direction is the axial direction of the optical fibers. (See, *Zheng*, Fig. 1). In contrast to amended claim 4, *Zheng* discloses that the fine alignment of the abutment portions of the optical fibers (1 and 1') along an axial direction (i.e., the Z direction) is *performed prior to a preliminary arc discharge*. (See, *Zheng*, col. 6, lines 10-14 and Figs. 3a-3b). As discussed above, amended claim 4 includes, in part, that the

positioning of the abutment portion of the optical fibers along the axial direction is *based on the estimated heating center of the preliminary arc discharge*. Therefore, in *Zheng*, the result of the preliminary arc discharge does not factor in the positioning of the abutment portion of the optical fibers along the axial direction thereof. Accordingly, *Müssig* and *Zheng*, even if properly combinable, do teach, disclose or suggest all of the elements of claim 4.


Accordingly, for at least the reasons set forth above, claim 4 and claim 5 that depends therefrom, are each patentably distinguished over the combination of *Müssig* and *Zheng* and are in condition for allowance.

Accordingly, Applicant respectfully submits that the present application is in condition for allowance and respectfully solicits allowance of same.

Respectfully submitted,

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